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## The Mollusca of the Santa Barbara County Area

### Part I - Pelecypoda and Scaphopoda

BY

EUGENE COAN

University of California, Santa Barbara

DALL (1921) LISTED RANGES of many species of mollusks as terminating, either in their northern or southern extremes, in Santa Barbara County, California. Many of these records were based on the work of Lorenzo G. Yates, whose faunal list of the county (1890 b) and other papers (1877 and 1890 a) included many original collecting data. Since the time of YATES and DALL there has not been a comprehensive list of the species in this area, although BERRY (1956), HEWATT (1946), BARNARD & HARTMAN (1959), and GRAU (1959) have published a few records. There is need of a list of species currently collected from this region in order to substantiate the previously published records.

During the past two years, in connection with a course at the University of California at Santa Barbara, I have attempted to make as complete a survey of the mollusks of the Santa Barbara County area as I could, revising the existing collection of the University in the process, and adding such material to that collection as might prove useful. The following list is the result of that work. Because of the time involved in the preparation of this table and the difficulty of identifying the Gastropoda, Amphineura, and Cephalopoda at this time, it was decided to restrict this paper to the Pelecypoda and Scaphopoda and to complete the work on the other three groups at a later date.

Santa Barbara County is a rectangle of land with a coast line of about 100 miles, not including its three channel islands, San Miguel, Santa Rosa, and Santa Cruz. Anacapa, the southern member of this chain of islands, is in Ventura County. Most authors agree that, with regard to shore and shallow water fauna, Point Conception, in Santa Barbara County, is a significant dividing point between the faunas of Northern California, Oregon,

and Washington, and that of Southern California. For additional information and discussion of this transition two types of account may be found in SCHENCK & KEEN (1936) and NEWELL (1948). The transition is not abrupt at any one point, but the bulk of the change takes place between Point Arguello and Point Conception. This transition is ascribed to currents and a temperature gradient. About half of the 100-mile coast line lies north of Point Conception. I collected beach specimens on the north side of Point Conception, finding on one trip over 75 species of mollusks. Many of these specimens confirmed what had been questionable northern or southern range limits.

Most of the Santa Barbara coastline is sand beach, with one headland after another jutting into the long expanse of sand. There is one feature of special interest with regard to the sand itself -- the fact that it undergoes a yearly cycle of movement along the coast. About half of the year most of the rocks on the University Campus beach, for instance, are covered by sand. As a result, there is never much life on these rocks. They are too often covered and abraded by the sand to bear even the limpets and chitons typical of somewhat less sandy rocks. When they do become uncovered, green algae are about all that gets a foothold before the rocks are once more buried, though, no doubt, the juvenile stages of other plants and of animals begin to settle during the uncovered period. The extent to which the sand moves varies along the southern Santa Barbara coastline.

Another aspect of Santa Barbara beaches is of interest: tar. There are several tar seeps along the coast, the presence of tar and oil being further testified to by the many offshore oil rigs. The tar seeps are especially productive in the U. C. S. B. -- Coal Oil Point area, the latter being so named for obvious reasons. The tar continually

oozes out of the offshore cracks and rises to the surface in masses. It floats around, and much of it comes to shore where it is deposited along the high tide line. Many of the intertidal rocks in certain areas, such as at Goleta Point, are almost covered with a layer of sticky tar. However, it is surprising, that, even in the most heavily tarred areas, there are always a few hardy mollusks that do not seem to be affected by the tar and the odor of kerosene -- a few limpets, chitons and mussels.

Some time ago I held the probably common belief that picking up beach specimens was a "wrong" way to collect mollusks. I have since modified this position, for I have added many species to the Santa Barbara list from materials washed up on the Campus beach, species which may live well off-shore. In this connection, there is one problem in collecting beached material in Santa Barbara County, one true of many southern California areas -- that of the mixing of freshly-dead and fossil material on the beaches. For instance, material from the Late Pliocene or Early Pleistocene Santa Barbara formation occasionally washes out to the beaches, and there are even places where this formation extends almost to the water line. There is, in addition, a Recent marine terrace, along the cliffs in the immediate U. C. S. B. area. It contains a fauna much like that of Puget Sound. If I had not finally made a representative collection of the formation, I might still be puzzling over some beach specimen of *Thais lamellosa*, *Acmaea instabilis*, or *Calyptrea fastigata*. The material is in a remarkable state of preservation, periostracum and bits of ligament remaining on many of the clams.

To complicate the situation further, there is Goleta Slough, the remains of what once was a large lagoon. The existence of this lagoon in fairly recent times is evidenced by sub-fossil mollusks along its banks and in Indian kitchen middens in the surrounding area. DALL (1921) and other authors of his period and before, list the Goleta area as the northernmost outpost of many of the southern California lagoon species. Species typical of these two deposits include *Aequipecten*, two species of *Chione*, one of *Tagelus*, and one of *Sanguinolaria*. None of these forms have been recently found living in the slough, which, as far as I can see, contains only *Cerithidea*, *Assiminea*, and *Melampus*. Material from these two sub-fossil beds, natural and Indian created, may be found washed up on the nearby beaches.

There seem to be two types of headlands jutting out into the sand beaches: rubble points like Rincon Point, and large rock points, like Goleta Point (some points are combinations of these two types). The rubble points have their own typical fauna. Special demands are placed on the inhabitants by the abrading sand. Such an area

typically has *Acmaea fenestrata*, *Mopalia porifera*, *M. acuta* and *M. muscosa*. The large rock points support a fauna similar to that in like areas throughout the coast -- *Mytilus* spp., *Septifer*, *Thais*, *Lasaea*, *Nuttallina*, and the several species of *Acmaea*.

As well as these two headland types, there are a few rock reefs (such as Carpenteria reef) that are intertidal. There are numerous offshore reefs, some exposed above the bottom sediments as far down as forty feet. These reefs are composed of the same rocks that compose both the cliffs along the coast and the large rock points, the Miocene Monterey shale.

By far the commonest species washed up on Santa Barbara beaches is the boring myad, *Platyodon cancelatus*. The intertidal and subtidal reefs are ideal for its existence, and the enormous number of valves washed up all along the coast testifies to its presence by the millions. Also, the reefs, including the famous one at Carpenteria, abound in rock borers and the associated nestlers. I have found all the common pholads at Carpenteria, as well as washed up on the Campus beach, including *Chaceia*, *Parapholas*, the three species of *Penitella*, *Netastoma*, and *Zirfaea*. The nestlers *Thracia curta*, *Diplodonta orbella*, *Petricola carditoides*, *P. californiensis*, *Cumingia*, and *Hiatella* are found in old pholad holes.

In general, diving is not as successful as it is in other places in California, mainly because fine offshore sediments and temporary plankton blooms make for poor visibility. The subtidal reefs are scattered and are often sand-covered. The immediate area of the kelp beds is best; most fruitful is a trip to the channel islands, where rocks are exposed as deep as SCUBA equipment allows most divers to go, i. e., 150 feet.

Forms typical of the kelp holdfast area of the rock-sand bottom include *Jaton*, *Maxwellia gemma*, *Mitra idae* and *Astraea undosa*. *Zonaria*, *Megathura*, and *Haliotis* spp. are to be found on the nearby underwater reefs.

On the sand bottom near the holdfasts may be found *Kelletia*, two species of *Nassarius*, two species of *Olivella*, and one of *Acteon*. Many unusual forms turn up in beached kelp holdfasts or in siftings from 30 to 40 feet, such as *Lamellaria orbiculata*, *Volvulella cylindrica*, *Acmaea rosacea* and *Calliostoma splendens*.

Most of the elements of the typical southern California fauna reach the southern Santa Barbara County area, many of them being scarce, however. In general, Santa Barbara intertidal populations are small, but the variety is surprising. The same seems to be true of the shallow water fauna. I would guess that if one were to collect both in the northern and in the southern portions of this county, carefully and consistently, as well as on the three channel islands, Santa Barbara would prove to have the largest fauna of any of the California counties.

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## EXPLANATION OF THE TABLE

The species are listed in taxonomic order, following KEEN (1963). The following abbreviations are used for localities in the Santa Barbara County area (see map):

- 1 - Point Conception, including about five miles north (Jalama) and south
- 2 - Gaviota south to Tajiguas
- 3 - Coal Oil Point
- 4 - University of California, Santa Barbara, and Goleta area
- 5 - Hope Ranch
- 6 - Santa Barbara City and Harbor
- 7 - Carpenteria
- 8 - Rincon Point (partly in Ventura County)
- 9 - San Miguel Island
- 10 - Santa Rosa Island
- 11 - Santa Cruz Island
- 12 - Anacapa Passage, including area just off the west end of Anacapa Island
- 13 - Anacapa Island (Ventura County).

The following abbreviations are used for the names of persons reporting species in published lists or in substantial lists provided to me for this table.

- BH - BARNARD & HARTMAN (1959)  
 B - BERRY (1956)  
 EC - Eugene Coan  
 FH - Faye Howard  
 G - GRAU (1959)  
 H - HEWATT (1946)  
 M - James McLean

## PELECYPODA

## NUCULIDAE

- Acila castrensis* (HINDS, 1843) - 11, 12 (B)  
*Nucula* cf. *N. cardara* DALL, 1916 - several stations (BH)  
*Nucula tenuis* (MONTAGU, 1808) - 11 (B)

## NUCULANIDAE

- Nuculana acuta* (CONRAD, 1832) - 11 (H) [reported  
in quotation marks]  
*Nuculana hamata* (CARPENTER, 1864) - 12 (B)  
*Nuculana taphria* (DALL, 1896) - 4, 6 (EC); 5 (FH);  
11 (B)  
*Yoldia cooperi* GABB, 1865 - 4 (EC)

## GLYCYMERIDIDAE

- Glycymeris subobsoleta* (CARPENTER, 1864) - 9 (EC);  
10 (B) [as *G. corteziana*]

## PHILOBRYIDAE

- Philobrya setosa* (CARPENTER, 1864) - 11 (H)

## PINNIDAE

- Atrina oldroydii* DALL, 1901 - "off Santa Barbara" (EC)

## MYTILIDAE

- Adula californiensis* (PHILIPPI, 1847)  
- 1, 3, 4 (EC); 7 (FH)  
*Adule falcata* (GOULD, 1851) - 1, 3, 4 (EC); 5 (FH)  
*Amygdalum pallidulum* (DALL, 1916) - 12 (B)  
*Hormomya adamsiana* (DUNKER, 1857)  
- 11 (H); 13 (EC)  
*Lithophaga plumula* (HANLEY, 1844)  
- 3, 4, 7, 13 (EC); 1 (M); 11 (H)  
*Modiolus capax* CONRAD, 1837 - 1, 4, 7, 13 (EC)  
*M. modiolus* (LINNAEUS, 1758) - 11 (H)  
*M. rectus* CONRAD, 1837 - 4, 6 (EC)  
*Mytilus californianus* CONRAD, 1837  
- 1, 2, 3, 4, 6, 8 (EC); 5 (FH); 11 (H)  
*M. edulis* LINNAEUS, 1758 - 1, 3, 4, 6, 7 (EC); 5 (FH)  
*Septifer bifurcatus* (CONRAD, 1837)  
- 1, 2, 3, 4, 6, 7 (EC); 5, 10 (FH); 11 (H)

## OSTREIDAE

- Ostrea lurida* CARPENTER, 1864 - 4, 6 (EC); 5 (FH)

## PECTINIDAE

- Aequipecten circularis aequisulcatus* (CARPENTER, 1864)  
- 4 (EC); "S. B. Ids." (G)  
*Chlamys hastata* (SOWERBY, 1842)  
- "S. B. Ids." (G); 11 (H); 12 (B)  
*C. pugetensis* (OLDROYD, 1920) - "S. B. Ids." (G)  
*Cyclopecten catalinensis* (WILLETT, 1931) - 11 (G)  
*Delectopecten randolphi tillamookensis* (ARNOLD, 1906)  
- "S. B. Ids." (G)  
*D. vancouverensis* (WHITEAVES, 1893) - "S. B. Ids." (G)

- Hinnites multirugosus* (GALE, 1928)  
- 1, 2, 3, 4, 6, 13 (EC); 5, 10 (FH); 11 (H)
- Leptopecten latauratus* (CONRAD, 1837) - 10 (FH)
- L. monotimeris* (CONRAD, 1837)  
- 1, 4, 6 (EC); 5 (FH); 11 (H)
- Pecten diegensis* DALL, 1898  
- 1, 4 (EC); "S. B. Ids." (G); 12 (B)
- LIMIDAE
- Lima hemphilli* HERTLEIN & STRONG, 1946  
- 4, 6, 7 (EC); 5 (FH); 11 (H) (B)
- ANOMIIDAE
- Anomia peruviana* D'ORBIGNY, 1846  
- 4 (EC); 5 (FH); 11 (H)
- Pododesmus cepio* (GRAY, 1849)  
- 1, 2, 3, 4 (EC); 5, 10 (FH)
- CHAMIDAE
- Chama pellucida* BRODERIP, 1835  
- 4, 6, 7, 8, 13 (EC); 5, 10 (FH); 10 (B); 11 (H)
- Pseudochama exogyra* (CONRAD, 1837)  
- 3, 4, 6, 7, 13 (EC); 5 (FH)
- P. granti* STRONG, 1934 - 12 (B)
- CARDITIDAE
- Cardita longini* BAILY, 1945 - 10, 12 (B)
- C. ventricosa* GOULD, 1850  
- several stations (BH); 11 (H)
- Glans carpenteri* (LAMY, 1922)  
- 4, 6, 7, 13 (EC); 5 (FH); 11 (H)
- Milneria kelseyi* DALL, 1916 - 11 (H)
- ERYCINIDAE
- Lasaea cistula* KEEN, 1938 - 4, 13 (EC)
- KELLIIDAE
- Kellia laperousii* (DESHAYES, 1839)  
- 1, 4, 6, 7, 13 (EC); 5 (FH); 11 (H)
- MONTACUTIDAE
- Mysella* sp. - 4 (EC)
- LUCINIDAE
- Epilucina californica* (CONRAD, 1837) - 3, 4, 5, 7 (EC)
- Here excavata* (CARPENTER, 1857) - 4 (EC)
- Luciniscia nuttalli* (CONRAD, 1837) - 4 (EC)
- Lucinoma* cf. *L. aequizonata* (STEARNS, 1890)  
- 4 (EC) "beach"
- UNGULINIDAE
- Diplodonta orbella* (GOULD, 1852)  
- 3, 4, 6, 7, 13 (EC); 1, 5, 10 (FH)
- D. sericata* (REEVE, 1850) - 11 (H)  
[juv. *D. orbella*? (EC)]
- D.* cf. *D. subquadrata* (CARPENTER, 1856) - 12 (B)  
[juv. *D. orbella*? (EC)]
- CARDIIDAE
- Clinocardium nuttalli* (CONRAD, 1837)  
- 4, 6 (EC); 5 (H)
- Laevicardium substriatum* (CONRAD, 1837) - 7 (EC)
- Nemocardium centiflosum* (CARPENTER, 1864)  
- 10 (EC); 11 (B) (H); 12 (B)
- Trachycardium quadragenarium* (CONRAD, 1837)  
- 4, 5, 6 (EC); 10 (FH); 11 (B) (H)
- VENERIDAE
- Amiantis callosa* (CONRAD, 1837) - 5 (FH)
- Chione californiensis* (BRODERIP, 1835) - 6 (EC)
- C. undatella* (SOWERBY, 1835) - 4, 6 (EC)
- Compsomyax subdiaphana* (CARPENTER, 1864)  
- 4 (EC); several stations (BH); 11 (B) (H)
- Notirus lamellifer* (CONRAD, 1837)  
- 1, 3, 4 (EC); 11 (H); 10 (FH)
- Protothaca laciniata* (CARPENTER, 1864)  
- 4, 6 (EC); 5 (FH)
- P. staminea* (CONRAD, 1837)  
- 1, 3, 4, 6, 7, 8 (EC); 5 (FH)
- P. tenerrima* (CARPENTER, 1856) - 4 (EC)
- Saxidomus nuttalli* CONRAD, 1837  
- 1, 4, 6 (EC); 5, 10 (FH)
- Tapes semidecussata* REEVE, 1864 - 1, 7? (FH)
- Tivela stultorum* (MAWE, 1823)  
- 3, 4, (EC); 5 (FH); 11 (H)
- Transennella tantilla* (GOULD, 1853)  
- 1, 3, 4, 6 (EC); 5, 10 (FH); 11 (H)
- Ventricolaria fordii* (YATES, 1890) - 1, 3, 4 (EC)
- PETRICOLIDAE
- Petricola californiensis* PILSBRY & LOWE, 1932  
- 3, 4, 7 (EC)
- P. carditoides* (CONRAD, 1837)  
- 1, 3, 4, 6 (EC); 5, 7, 8 (FH); 11 (H)
- COOPERELLIDAE
- Cooperella subdiaphana* (CARPENTER, 1864) - 11 (H)
- MACTRIDAE
- Spisula* cf. *S. planulata* (CONRAD, 1837) - 12 (B)
- Tresus nuttallii* (CONRAD, 1837) - 1, 4, 6 (EC); 10 (FH)
- TELLINIDAE
- Macoma indentata* CARPENTER, 1864 - 4 (EC)
- M. inquinata* (DESHAYES, 1854) - 1, 4 (EC); 5 (FH)
- M. nasuta* (CONRAD, 1837) - 4, 6 (EC); 10 (FH)
- M. secta* (CONRAD, 1837) - 4, 6 (EC)
- M. yoldiformis* CARPENTER, 1864  
- 4 (EC); several stations (BH); 11 (H)
- Florimetus biangulata* (CARPENTER, 1855)  
- 4 (EC); 5 (FH)
- Tellina bodegensis* HINDS, 1844 - 1, 4, 10 (EC)

- T. cf. T. buttoni* DALL, 1900 - 4 (EC); 5 (FH)  
*T. carpenteri* DALL, 1900 - 11, 12 (B)

## DONACIDAE

- Donax gouldii* DALL, 1921 - 4 (EC)

## GARIDAE

- Gari californica* (CONRAD, 1849) - 3, 4, 6 (EC); 11 (H)  
*Sanguinolaria nuttallii* CONRAD, 1837 - 4 (EC)

## SEMELIDAE

- Cumingia californica* CONRAD, 1837  
 - 3, 4, 6, 7, 13 (EC); 5, 10 (FH)  
*Semele decisa* (CONRAD, 1837) - 3, 4 (EC)  
*S. incongrua* CARPENTER, 1864 - 11 (H); 12 (B)  
*S. rubropicta* DALL, 1871 - 3, 4 (EC); 5 (FH)  
*S. rupicola* DALL, 1915 - 1, 3, 4, 13 (EC); 11 (H)

## SOLECURTIDAE

- Tagelus californicus* (CONRAD, 1837) - 4, 6 (EC)

## SOLENIIDAE

- Siliqua patula* (DIXON, 1789) - 4, 6 (EC)  
*Solen rosaceus* CARPENTER, 1864 - 4 (EC)  
*S. sicarius* GOULD, 1850 - several stations (BH); 11 (H)

## MYIDAE

- Cryptomya californica* (CONRAD, 1837)  
 - 4, 6 (EC); 5 (FH)  
*Platyodon cancellatus* (CONRAD, 1837)  
 - 1, 3, 4, 7 (EC); 5, 10 (FH)  
*Sphenia* sp. - 4 (EC)

## HIATELLIDAE

- Hiatella arctica* (LINNAEUS, 1767)  
 1, 3, 4, 6, 7, 13 (EC); 5 (FH); 11 (H); 12 (B)  
*Panopea generosa* GOULD, 1850 - 4 (EC)  
*Saxicavella pacifica* DALL, 1916 - several stations (BH)

## PHOLADIDAE

- Barnea subtruncata* (SOWERBY, 1834) - ?4 (EC)  
*Chaceia ovoidea* (GOULD, 1851) - 4, 7 (EC); 1 (FH)  
*Netastoma rostrata* (VALENCIENNES, 1846)  
 - 1, 4, 7 (EC)

- Parapholas californica* (CONRAD, 1837)  
 - 1, 3, 4, 7 (EC)

- Penitella conradi* VALENCIENNES, 1846 - 4, 13 (EC)  
*P. gabbi* (TRYON, 1863) - 4, 7 (EC)  
*P. penita* (CONRAD, 1837) - 1, 3, 4, 6, 7 (EC); 5 (FH)  
*Zirfaea pilsbryi* LOWE, 1931 - 4 (EC); 10 (FH)

## TEREDINIDAE

- Teredo* cf. *T. diegensis* BARTSCH, 1916 - 3 (EC)

## PANDORIDAE

- Pandora punctata* CONRAD, 1837 - 4 (EC)

## LYONSIDAE

- Entodesma inflata* (CONRAD, 1837) - 10 (EC); 11 (H)  
*E. saxicola* (BAIRD, 1863) - 1, 4, 6, 13 (EC); 7, 10 (FH)  
*Lyonsia californica* CONRAD, 1837 - 6 (EC); 11 (H)

- Mytilimeria nuttallii* CONRAD, 1837  
 - 1, 4, 6, 7, 8 (EC); 5, 10 (FH); 11 (H)

## THRACIIDAE

- Thracia curta* CONRAD, 1837 - 3, 4, 7 (EC)

## CUSPIDARIIDAE

- Cardiomya californica* (DALL, 1886) - 12 (B)

## SCAPHOPODA

## DENTALIIDAE

- Dentalium neohexagonum* SHARP & PILSBRY, 1897  
 - 4 (EC); 5 (FH)

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